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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/680,302	10/08/2003	Atsushi Iwata	2635-183	5485

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EXAMINER

BAREFORD, KATHERINE A

ART UNIT	PAPER NUMBER
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1762

DATE MAILED: 08/22/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/680,302

Applicant(s)

IWATA, ATSUSHI

Examiner

Katherine A. Bareford

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) 1-4 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 5-7 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 08 October 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 10/03.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: ____.

S. 2-0

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-4, drawn to a method, classified in class 427, subclass 8.
 - II. Claims 5-7, drawn to a method, classified in class 427, subclass 8.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I and II are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions have different modes of operation, as Invention I has taking a single measurement for comparison and Invention II has taking multiple measurements for comparison.

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

4. During a voice mail message by Mr. Nixon on March 15, 2005 a provisional election was made with traverse to prosecute the invention of Group II, claims 5-7. Affirmation of this election must be made by applicant in replying to this Office action.

Claims 1-4 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Specification

5. The abstract of the disclosure is objected to because it appears to be longer than 150 words.

Correction is required. See MPEP § 608.01(b).

Claim Rejections - 35 USC § 112

6. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

7. Claims 5-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 5, lines 12-14, applicant should clarify that the measured radii are of the solid-electrolyte body plus the electrode layer, as described at pages 10 and 28 of the specification and figure 8.

Claim 5, lines 28+, it is unclear how the controlling is actually done. How is the average of differences between the radii used? Also when does controlling occur? Is it on the same article or on a different later article?

Claim 7, this claim is unclear as to whether 180 different points are measured (every one degree) or whether up to 180 points can be measured.

The other dependent claim does not cure the defects of the claim from which it depends.

Claim Rejections - 35 USC § 103

8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

9. Claims 5 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted state of the prior art in view of Japan 2000-282214 (hereinafter '214) and GB 2 138 562 A (hereinafter '562).

The admitted state of the prior art, at pages 1-3 of the specification, teaches that when manufacturing gas sensor elements, it is known to provide a cylindrical and substantially tumbler-shaped solid-electrolyte body which has a closed-end head portion, and on the side opposite to the head portion, an open-ended base tail portion. An electrode is provided on the surface of the solid-electrolyte body. A porous protective layer is provided that covers the surface of the electrode. In formation, plasma thermal spraying can be used to form the protective layer, which would provide

spraying a molten protective layer material on the electrode covered surface of the solid-electrolyte body. The admitted state of the prior art further teaches that the solid-electrolyte bodies have uneven surfaces, and hence electrodes formed on the surfaces of such bodies also have uneven surfaces reflecting the uneven surfaces of the solid-electrolyte bodies. Thus, it has been difficult to deal with the problem of non-uniform coatings when forming the protective layers.

The admitted state of the prior art teaches all the features of these claims except for how to provide the even coating by measuring radii as claimed and controlling thickness based on these measurements.

However, '214 teaches a method of thermal spray coating (which includes plasma spray coating) onto cylindrical shaped bodies. Abstract, paragraph [0002] and figure 1. Coating thickness can be controlled to provide a uniform coating. Abstract and paragraph [0006]. The process includes rotating the body to be coated and measuring distance to a distance measuring head at multiple points as the body is rotated around its axis. Abstract, figure 1 and paragraphs [0013] – [0015]. This would include measuring distances selected along a peripheral circle C on the surface of the body. Abstract, figure 1 and paragraphs [0013] – [0015] (note the rotation). Then thermal spraying occurs, whereby a layer is sprayed onto the surface. Abstract. After spraying, the distance to the distance measuring head is again measured at multiple points on the body. Abstract and figure 1. The first measured distances and the second measured distances are compared to judge whether the required film thickness has been achieved.

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Abstract and paragraph [0006]. This allows controlling the amount of spray based on these measurements until the desired thickness has been achieved. Abstract and paragraph [0006].

'562 teaches a method of measuring the profile of an irregular shaped article using a measuring system. Page 1, lines 1-10. The measuring system rotates a head H around the axis of the article and performing a series of measurements around the cross-sectional area of the product. Page 1, lines 100-110. As the rotating head H goes through one complete cycle (180 degrees of rotation) a series of profile measurements are made which represent the ordinates of the profile of the material. Page 1, lines 100-110. The measurements are of the diameter of the article. page 1, lines 85-90 and page 2, lines 5-25 and page 2, lines 75-85. The measurements can be taken before coating and then again after coating. Page 2, lines 90-100 and page 3, lines 70-75. The measurements are compared to determine the coating thickness. Page 2, lines 90-100. The comparison of measurements can be used to control the amount of coating applied in a closed loop control. Page 2, lines 80-90.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the admitted state of the prior art to provide a measuring system as suggested by '214 and '562 in order to provide a desirably uniform coating, because the admitted state of the art teaches to thermal spray a cylindrical object such as a gas sensor and a desire to provide a uniform coating on the sensor, and '214 teaches the desire to use measurements at multiple points before and after coating

when thermal spraying a cylinder in order to control the coating thickness applied over the surface of the cylinder, and '562 provides a further desirable method of measuring the diameter of an article at different points before and after coating to provide for optimization of the coating thickness. As a result, the combination of the references would provide that a desirable method would be to measure the diameter (which ^{also} ~~as~~ provides measurements of the corresponding radii) of the surface to be coated at a variety of points while rotating the body (as shown by '214 and '562 either the body or the measuring device should be rotated relative to the other) before coating, then ^{also} ~~as~~ applying the coating, and then performing the measurements again. Then, the results can be compared to control the application of the coating to give a final, uniform layer of coating. As to the position of measurements of claim 7, '562 provides for measuring at various points up to 180 degrees as required by claim 7. As to the exact number of points to be measured, ^e ~~o~~ of ordinary skill in the art would perform routine experimentation to determine the optimum number for the specific substrate to be used.

10. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted state of the prior art in view of '214 and '562 as applied to claims 5 and 7 above, and further in view of Friese et al (US 5731030).

The admitted state of the prior art in view of '214 and '562 teaches all the features of this claim except the multiple sensor manufacturing and the feedback control based on the last sensor made.

However, Friese teaches the thermal spraying of substrates such as oxygen (gas) sensors. Column 3, lines 10-15. The parts are sprayed in a mass production process. Column 3, lines 10-15. Friese teaches providing a measuring and testing system to control the thickness of the applied coating. Column 3, lines 15-50 and figure 1. Friese further teaches that this measuring and testing system can be used to provide feedback control based on the last sensor made. Column 2, lines 20-30.

It would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the admitted state of the prior art in view of '214 and '562 to provide for mass production manufacturing of the sensors and to use the thickness control to provide feedback control based on measurements from the last sensor made as suggested by Friese, in order to provide rapid and controlled

manufacture, because ^{the} admitted state of the prior art in view of '214 and '562 teaches a thermal spraying method for controlling thickness when coating gas sensors and Friese teaches that when providing a thermal spraying method for controlling thickness when coating gas sensors, it is desired to provide for mass production manufacturing of the sensors and to use the thickness control to provide feedback control based on measurements from the last sensor made.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Katherine A. Bareford whose telephone number is (571)

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272-1413. The examiner can normally be reached on M-F(6:00-3:30) with the First Friday Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy Meeks can be reached on (571) 272-1423. The fax phone numbers for the organization where this application or proceeding is assigned are (571) 273-8300 for regular communications and for After Final communications.

Other inquiries can be directed to the Tech Center 1700 telephone number at (571) 272-1700.

Furthermore, information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


CATHERINE BAREFORD
PRIMARY EXAMINER